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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/703,264	10/31/2000	James C.H. Thi	37366/CAG/B600	9016
23363	7590	11/02/2004	EXAMINER	
CHRISTIE, PARKER & HALE, LLP			JAMAL, ALEXANDER	
PO BOX 7068			ART UNIT	
PASADENA, CA 91109-7068			PAPER NUMBER	
			2643	

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/703,264	Applicant(s) THI ET AL.	
	Examiner Alexander Jamal	Art Unit 2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Examiner notes that claims 1,11,22,33,37 have been amended.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 11-32** rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Independent claims 11 and 22 both claim “a **single** adaptive filter having filter coefficients adapted to cancel an echo in a near end signal, the echo comprising an acoustic **and** electrical echo. Applicant’s Fig. 8 discloses transfer functions 402,404 used to adapt to acoustical echo and transfer function 400, which is used to adapt to electrical echo. Examiner reads each transfer function as a separate filter. Applicant’s specification does not enable the use of a **single** filter (transfer function) that will adapt itself so as to output an acoustic and electrical estimate. The

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output of applicant's transfer function (filter) 404 cannot be used to cancel the electrical echo that is cancelled via the use of transfer function (filter) 400.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1-3,6,8-10,33,36,37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Eppler Jr. et al (5600714), and further in view of Finn (5706344).

As per **claim 1**, Eppler discloses an echo canceller (in a communications system) comprising a single adaptive filter 24 and coefficients adapted to cancel an echo in a near end signal (from microphone 12 in Fig. 1). The echo comprises part of a far end signal (signal from telephone system 34 in Fig. 1) (ABSTRACT). However, Eppler does not disclose that the echo comprises a portion of a secondary audio signal.

Finn teaches that in echo canceller systems, a far end signal (voice) and a secondary audio signal may be combined and output to the near end speaker and also output to an adaptive echo canceller in order to reduce the echo that both the voice and secondary audio signal produce in the near end microphone. It would have been obvious to one of ordinary skill in the art at the time of this application that a secondary audio signal could be summed with the far end voice signal and the combination sent to the

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echo canceller (as well as the near end loudspeaker) in order to help remove the echo created in the near end microphone by both signals.

As per **claim 33**, claim 33 is rejected for the same reasons as claim 1 and the additional teachings from Finn that the primary and secondary signals are combined into a reference signal that is adaptively filtered, and then subtracted from the near end signal (FINN: Col 1 lines 23-44).

As per **claim 37**, claim 37 is rejected for the same reasons as claims 1 and 33. The combining, filtering and subtracting means are inherent to the system for the purpose of combining, filtering, and subtracting the primary and secondary signals as specified in the rejections of claim 33.

As per **claim 2**, Eppler discloses that the filter is a finite impulse response filter (Col 6 lines 25-36) (Col 7 lines 17-25).

As per **claim 3**, Eppler's FIR filter is implemented as a linear transversal filter as seen in Fig. 2 (Col 6 lines 38-51) (Col 7 lines 17-25).

As per **claim 6**, the system of Eppler and Finn inherently comprises a buffer coupled to (FINN: Fig. 1) the adaptive filter 24 via the receive path and amplifier 76 for the purpose of combining the primary and secondary signals as taught by Finn.

As per **claim 8**, In Eppler's echo canceller (Fig. 1) in view of Finn's teachings, the adaptive filter generates an echo estimate of the combined primary and secondary

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signals. The cancellation of the echo in the near end signal is a function of the estimated echo (Col 6 lines 37-51) (Col 7 lines 17-25).

As per **claim 9**, Eppler's echo canceller further comprises difference operator 20 (Fig. 1) to subtract the echo estimate from the near end (input waveform at terminal 38 in Fig. 1) signal (Col 6 lines 37-51) (Col 7 lines 17-25).

As per **claim 10**, In Eppler's echo canceller the output of difference operator 44 (Fig. 1) is fed-back to the echo canceller as an error signal for filter adaptation (Col 4 lines 20-39) (Col 6 line 65 to Col 7 line 16).

As per **claim 36**, In Eppler's method the adaptive filtering of the reference signal (the combination of two signals as taught by Finn) comprises generating an estimate of the echo as a function of the transfer function of the electrical (EPPLER: terminals 36, 38 Fig. 1) and acoustical (EPPLER: microphone 12 and speaker 58) echo paths (Col 6 lines 18-37) with echo cancellers 24,46. Additionally, any electrical echo that is not cancelled by canceller 46 will propagate through to canceller 24. As such, the echo estimate generated by canceller 24 will be a function of the electrical echo, with the electrical echo being a function of the electrical echo path.

6. **Claims 4,35,39** rejected under 35 U.S.C. 103(a) as being unpatentable over Eppler et al (5600714) and Finn (5706344) as applied to claims 1,33,37 above, and further in view of Sih (5732134).

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As per **claims 4,35,39**, Eppler and Finn disclose applicant's echo canceller as per claims 1,33,37. However, they do not teach the echo canceller comprising double talk logic to control the filter adaptation based upon speech in the near end signal.

Sih teaches an adaptive echo canceller configuration where the far end speech is used as reference signal to cancel echo, a double talk condition will corrupt the echo path estimate unless the coefficient adaptation of the filter is disabled during the double talk (Col 1 lines 52-67). It would have been obvious to one of ordinary skill in the art at the time of this application to include double-talk logic (by detecting speech in both the near and far end) and cease coefficient adaptation in order to prevent the corruption of the echo path estimate.

7. **Claim 5** rejected under 35 U.S.C. 103(a) as being unpatentable over Eppler et al (5600714) and Finn (5706344) as applied to claim 1 above, and further in view of Sellenslagh et al. (3433898).

As per **claim 5**, Eppler and Finn disclose applicant's echo canceller as per claim 1. However, they do not teach the secondary tone comprising a pulse metering tone.

Sellenslagh teaches that in certain telephony systems, it is desirable to generate pulse metering tones to increment call cost meters (Col 1 lines 29-47). It would have been obvious to one of ordinary skill in the art at the time of this application to include pulse metering as part of the terminal (and part of the secondary signal) for the purpose of controlling toll collection for services rendered to the user of the terminal.

8. **Claims 7,34,38** rejected under 35 U.S.C. 103(a) as being unpatentable over Eppler et al (5600714) and Finn (5706344) as applied to claims 1,6,33,37 above, and further in view of Hasegawa (5905717).

As per **claims 7, 34,38**, Eppler and Finn disclose applicant's echo canceller as per claims 1,6,33,37. However, they do not teach including a decimator to downsample the secondary audio signal to match that of the first.

Hasegawa teaches that in an adaptive filter echo canceller, the filter will be required to have a high-speed computation capability unless the rate of the input to the filter is converted (decimated) (Col 1 lines 15-27). It would have been obvious to one of ordinary skill in the art at the time of this application to include a decimator to down sample the primary signal, and also for the secondary signal to the same rate for the purpose of reducing the computation capability (and cost) required by the filter.

Response to Amendment

9. Applicant's arguments with respect to claims 11-32 have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's arguments filed 7-19-2004 have been fully considered but they are not persuasive.

As per applicant's argument regarding the Eppler reference requiring two filters (remarks page 10) as applied to newly amended claims 1,33,37, applicant has amended the independent claims to specify a **single** filter that is able to adapt itself so that it's output (echo estimate) may be subtracted from the transmission signal. The Eppler

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reference does disclose a **single** filter 24 (EPPLER: Fig. 1) that is able to perform the claimed functions (as disclosed in the above rejections). Examiner notes that applicant's Fig. 8 discloses multiple transfer functions 400, 402, 404. These comprise **multiple** filters. Each filter has a specific transfer function (emulating either an acoustic or electrical echo path) that must be applied to the appropriate signal in order for the system to function. There is not a single transfer function (filter) that can output both an acoustic and an electrical echo estimate.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 703-305-3433. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 703-305-4708. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9315 for After Final communications.

AJ
October 28, 2004


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